

Key Terms

- Acid Rain
- Anthracite
- Bituminous
- Continuous Mining Machines
- Deep Mining
- Fossil Fuel
- Global Warming
- Lignite
- Nonrenewable
- Subbituminous
- Surface Mining
- Underground Mining

Coal Facts

- The coal industry employs 120,000 Americans.
- Wyoming is the largest coal producing state.
- Coal provides more than 11 percent of the energy used by S.C. industries and about 1 percent of the energy used in S.C. homes.
- Russia, China, Australia, India, Indonesia and the United States are among the world's largest coal producers and consumers.

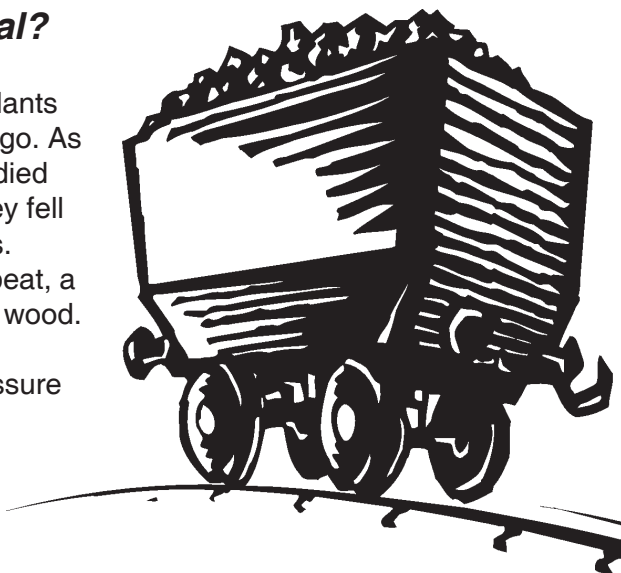
SOURCES: National Mining Association and 2001 S.C. Energy Use Profile

Coal

What is coal?

Coal began as swamp plants living 350 million years ago. As giant ferns and mosses died and started to decay, they fell to the bottom of marshes. Eventually they formed peat, a fuel that looks like rotten wood.

Over time, heat and pressure turned peat into coal. Geologists estimate it took a layer of swamp plants 20-feet thick to form a one-foot thick layer of coal. Coal is called a *fossil fuel* because it was made from plants that were once alive. The energy in coal came from the sun.



Coal is nonrenewable.

The coal we use today took millions of years to form. We can't make more in a short time. That's why it is called *nonrenewable*. There is a lot of coal in the United States – enough to last about 300 years.

Types of Coal

There are four basic types of coal. Each type of coal corresponds to a "grade." Grades represent the amount of carbon in coal. The higher the grade, the more carbon. And the more carbon, the greater the energy in the coal.

The top grade of coal is *anthracite*. *Bituminous* coal is the second highest grade. *Subbituminous* coal, having less carbon, is a lower grade of coal than bituminous. Least rich in carbon and energy is *lignite* coal.

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Where is coal found?

Coal is found throughout the world. Russia, China, Australia, India, Indonesia and the United States are especially rich with coal reserves. The National Energy Foundation estimates there may be 4 trillion tons of coal just in the United States.

Where do we get coal?

Coal is found in the ground. Coal is mined using two methods: *surface mining* and *underground mining*. If coal is near the surface, miners dig it up with huge machines. First, they scrape off the dirt and rock, then dig out the coal. This is called *surface mining*. After the coal is mined, they put back the dirt and rock. They plant trees and grass and the land can be used again.

Underground mining is done when the coal is buried deep in the earth. Tunnels called mine shafts are dug down to the coal. *Continuous mining machines* are used to dig the coal and carry it to the surface. Some mine shafts are 1,000 feet deep. This is called *deep mining*.

How is coal used?

Coal was once the most important of all the fossil fuels. Until World War II, coal supplied about 67 percent of the nation's energy needs. It was used to warm homes, fuel trains and operate factories.

With America's growing love for the automobile, petroleum replaced steam from burning coal as our fuel of choice for transportation. Other fuels also proved to be more useful for heating and cooling. Today, coal supplies slightly less than one-quarter of our energy needs.

After coal is mined it is cleaned and sent by trains to power plants and factories. The main use of coal today is in the production of electricity. Power plants burn coal to make steam and in turn electricity.

Coal and the Environment

Over time, we have learned that mining carries with it environmental responsibilities. Wastes from underground mining can pollute waters. The digging of mines can make land sink or shift. When this happens, nearby roads, sewers and buildings can collapse. Strip mining also removes ground water. This can cause wells to dry up and affects the animals and plants living in the area.

When coal is burned, it can pollute the atmosphere. Two major threats to our environment – *acid rain*¹ and *global warming*² – are thought to be aggravated by burning coal. To help ease these environmental concerns factories clean the coal before they burn it and they use scrubbers and other equipment to clean the smoke before it goes into the air.

To combat these threats to the environment, many laws have been passed requiring heavy coal users to lower their levels of pollution.

1. When coal is burned, sulfur in the coal combines with oxygen in the air to form sulfur dioxide. Sulfur dioxide is thought to be the principal cause of acid rain. As its name implies, acid rain is precipitation that has an unusually high acidity. The acid in this rain (or snow, fog, hail or dew) causes buildings and roads to erode.
2. Burning coal also releases carbon dioxide into the air. Increased carbon dioxide is believed to keep heat trapped within the Earth's atmosphere. This causes the climate to get continually warmer, a condition known as global warming.

Coal and South Carolina

Today, coal is one of the most important energy sources in South Carolina. It accounts for half of the electricity we use and one fourth of our total energy used in the United States. There are no coal reserves in South Carolina but 36 states have coal reserves. Coal, however, is used in more than 42 percent of all power plants in the state. Many South Carolina industries also use coal to run factories.



This fact sheet is a supplement to the Energy 2 Learn/E2IQ program and are targeted toward fifth- and sixth-grade students. Readers are encouraged to reproduce this material. For more information, about energy resources and conservation, call 1-800-851-8899 or visit www.energy.sc.gov. For information about solid waste issues, please call 1-800-768-7348 or visit www.scdhec.gov/recycle. Energy 2 Learn is a partnership of the S.C. Energy Office and DHEC's Office of Solid Waste Reduction and Recycling. This fact sheet was prepared with the support of the U.S. Department of Energy (DOE), Grant No. DE-FG44-00R410766, State Energy Program, administered by the South Carolina Energy Office. However, any opinions, conclusions, or recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the DOE.